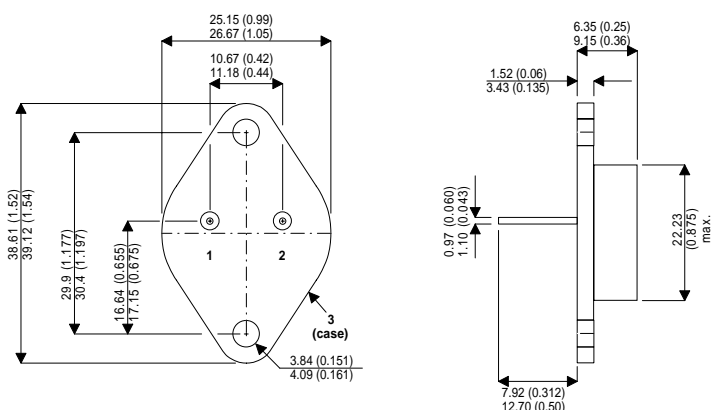


TO-3 (TO-204AA) Package Outline.
Dimensions in mm (inches)



Pin 1 – Gate Pin 2 – Source Case – Drain

**N-CHANNEL
ENHANCEMENT MODE
HIGH VOLTAGE
POWER MOSFET**

ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}C$ unless otherwise stated)

V_{DS}	Drain – Source Voltage ¹	200	V
V_{DGR}	Drain - Gate Voltage ($R_{GS} = 20K\Omega$) ¹	200	V
I_D	Continuous Drain Current @ $T_{case} = 25^{\circ}C$	9.0	A
I_D	Continuous Drain Current @ $T_{case} = 100^{\circ}C$	6.0	A
I_{DM}	Pulsed Drain Current ³	36	A
V_{GS}	Gate – Source Voltage	± 20	V
P_D	Maximum Power Dissipation @ $T_{case} = 25^{\circ}C$	75	W
	Derate Linearly	0.6	W/ $^{\circ}C$
I_{LM}	Inductive Current Clamped	36	A
E_{AS}^*	Single Pulse Avalanche energy Rating ⁴	150	mj
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150	$^{\circ}C$
T_L	Lead Temperature : 0.063" from Case for 10 Sec.	300	$^{\circ}C$

THERMAL CHARACTERISTICS

	Characteristic	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Junction to Case			1.67	$^{\circ}C/W$
$R_{\theta CS}$	Case to Sink (Mounting Surface flat, smooth and greased.)		0.1		
$R_{\theta JA}$	Junction to Ambient (Free air operation)			30	

NOTES

- $T_J = +25^{\circ}C$ to $+150^{\circ}C$
- Pulse Test PULSE Width $\leq 300\mu s$. Duty Cycle $\leq 2\%$
- Repetitive Ration Pulse Width Limited by Maximum Junction Temperature.
- $V_{DD} = 20V$ starting $T_J = +25^{\circ}C$, $L = 3.37mH$, $R_{GS} = 50\Omega$, $I_{PEAK} = 9A$

ELECTRICAL ($T_{case} = 25^{\circ}C$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
STATIC ELECTRICAL RATINGS					
BV_{DSS} Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	200			V
$V_{GS(TH)}$ Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2		4	V
I_{GSS} Gate Source Leakage forward	$V_{GS} = 20V$			100	nA
I_{GSS} Gate Source Leakage Reverse	$V_{GS} = -20V$			-100	nA
I_{DSS} Zero Gate Voltage Drain Current	$V_{DS} = \text{Max rating } V_{GS}=0V$			250	μA
	$V_{DS} = \text{Max rating} \times 0.8,$ $V_{GS}=0V \quad T_J = +125^{\circ}C$			1000	
$I_{D(ON)}^2$ On-State Drain Current	$V_{DS} > I_{D(ON)} \times r_{DS(ON)} \text{ Max.}$ $V_{GS} = 10V$	9			A
$r_{DS(ON)}^2$ Static Drain-Source On State Resistance	$V_{GS} = 10V, I_{DS} = 5.0A$		0.25	0.4	Ω
g_{ts}^2 Forward Transconductance	$V_{DS} > 50V, I_D = 5.0A$	3.0	4.8		S(Ω)
DYNAMIC CHARACTERISTICS					
C_{iss} Input Capacitance	$V_{GS} = 0V, V_{DS} = 25V$ $f = 1MHz$		600		pF
C_{oss} Output Capacitance			250		
C_{rss} Reverse Transfer Capacitance			80		
Q_g Total Gate Charge	$V_{GS} = 10V, I_D = 9A$ $V_{DS} = 0.8 V_{Max}$		19	30	nC
Q_{gs} Gate - Source Charge			10		
Q_{gd} Gate - Drain ("Miller") Charge			9.0		
$t_{d(ON)}$ Turn-On Delay Time	$V_{DD} \approx 100V, I_D = 5.0A,$ $R_G = 7.5\Omega$			35	ns
t_r Rise Time				80	
$t_{d(OFF)}$ Turn-off Delay Time				60	
t_f Fall Time				40	
SOURCE - DRAIN DIODE CHARACTERISTICS					
I_S Continuous Source Current (Body Diode)	Modified MOSFET symbol showing the integral reverse P-N junction rectifier.			9.0	A
I_{SM} Pulsed Source Current ¹ (Body Diode)				36	
V_{SD} Diode Forward Voltage ²	$T_J = +25^{\circ}C, I_S = 9A$ $V_{GS} = 0V$			2.0	V
t_{rr} Reverse Recovery Time	$T_J = +150^{\circ}C, I_S = 9A$ $V_{GS} = 0V, dl_F/dt = 100A/\mu s$		450		ns
Q_{rr} Reverse Recovery Charge	$T_J = +150^{\circ}C, I_S = 9A$ $V_{GS} = 0V, dl_F/dt = 100A/\mu s$		3.0		μC
t_{ON} Forward Turn-on Time		NEGLECTIBLE			
PACKAGE CHARACTERISTICS					
L_D Internal Drain Inductance			5.0		nH
L_S Internal Source Inductance (from 6mm down source lead to source bond pad)			12.5		

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